

CLAIMS

1. A method of indoor positioning in a structure (2) having corridors (10) and/or walls (8) extending in substantially perpendicular longitudinal (4) and lateral (6) directions, the method including:
- 5 providing a base station (20) with an antenna (28) having a cosec² sensitivity pattern oriented longitudinally;
- providing a mobile station (26) with an omnidirectional antenna (30);
- transmitting a ranging signal from one of the base station (20) and the
- 10 mobile station (26) to the other of the mobile station (26) and base station (20);
- and
- determining the relative signal strength of the received ranging signal compared with the transmitted signal to obtain a measure of lateral distance of the base station (20) from the mobile station (26).
- 15
2. A method according to claim 1 further comprising
- providing a second base station (22),
- transmitting a second ranging signal from one of the second base station (22) and the mobile station (26) to the other of the second base station
- 20 (22) and the mobile station (26); and
- determining the position of the mobile station using data from the ranging signals transmitted between the base stations and the mobile station.
3. A method according to claim 2 wherein the second base station
- 25 is provided with an antenna having a cosec² sensitivity pattern oriented laterally.
4. A method according to claim 2 or 3 further comprising:
- providing a third base station (24), and
- 30 transmitting a third ranging signal from one of the third base station (24) and the mobile station (26) to the other of the third base station (24) and the mobile station (26); and

determining the position of the mobile station (26) using data from the ranging signals transmitted between the base stations (20, 22, 24) and the mobile station.

5 5. A method according to claim 4 wherein the third base station is provided with an antenna having a cosec² sensitivity pattern oriented vertically.

6. A base station (20) for use in positioning a mobile station (26) in a structure having preferred longitudinal (4) and lateral directions (6),
10 comprising
 an antenna (28); and
 a transmitter and/or receiver (32) arranged to transmit and/or receive ranging signals to and/or from the mobile station through the antenna (28);
 wherein the antenna (28) has a cosec² sensitivity pattern for orientation
15 longitudinally, laterally or vertically in the building.

7. A system for positioning a mobile station in a structure having corridors and walls extending in substantially perpendicular longitudinal and lateral directions, the system comprising:
20 a plurality of base stations (20, 22, 24) according to claim 6; and
 a mobile station (26) having an omnidirectional antenna (30);
 wherein the system is arranged to transmit ranging signals between the mobile station (26) and the base stations (20, 22, 24) and to measure the attenuation of the received ranging signals relative to their transmitted
25 strength.

8. A system according to claim 7 wherein the system further includes code for calculating the position of the mobile station from the measured attenuation values and the positions of the base stations.

30

9. An installed system comprising:

a building (2) having corridors (10) and walls (8) extending in substantially perpendicular longitudinal (4) and lateral (6) directions; and

a plurality of base stations (20,22,24) according to claim 6 installed in the building, wherein:

5 a first one of the base stations (20) has its antenna (28) orientated with the cosec² pattern orientated longitudinally (4) within the building; and

 a second one of the base stations (22) has its antenna (28) orientated with the cosec² pattern orientated laterally (6) within the building.

10 10. An installed system according to claim 9 wherein a third one of the base stations (24) has its antenna (28) orientated with the cosec² pattern orientated vertically (12) within the building.